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Describes methods of studying *total* instructional costs on the basis of data on *total* faculty work load. Includes remarks on the historical development of this kind of analysis. Discusses briefly certain phases of the California–Western Conference Cost and Statistical Study and studies of individual institutions n other States. A related study, one dealing with an analysis of instructional *salary* costs on the basis of *teaching* load, by James I. Doi, is also listed in this volume of the *Reporter* (*see* 7407).

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XII. The Analysis of Class Size, Teaching Load and Instructional Costs

. . . . . Raymond W. Kettler

In the preceeding chapter, Dr. Doi has described techniques for analyzing instructional salary costs on the basis of teaching load. In this chapter, after some remarks on the historical development of this kind of analysis, I will describe methods of studying total instructional costs, on the basis of data on total faculty work load.

The Need for Analysis of Factors Affecting Instructional Costs

During the past quarter century, total annual expenditures for educational and general purposes of all institutions of higher education increased by at least 60 per cent. In the decade ahead, these expenditures may double or even treble, and thus may approach ten billion dollars a year. About 50 per cent, or five billion dollars, of this amount may be expended for instruction and departmental research. In some institutions an even greater percentage will be expended for this purpose.

These figures are no longer as startling as they were a few years ago. Actually, it is likely that they may be quite conservative. However, further inflation and advances in knowledge requiring new facilities and more costly supplies and equipment may multiply expenditures far beyond that which we presently foresee.

As total expenditures for instruction and departmental research increase, it will become more necessary to analyze factors affecting these costs. Every effort must be made to effect maximum economy, not to save dollars, but to be certain that the total resources available for higher education are used most wisely. Unless this is done, we shall fail to provide the educational opportunities that will be demanded. Since so large a percentage of the operating dollar is used for instruction and research, this area provides an unusually fertile field for careful analysis of the factors affecting these costs.

In addition to our own desire to use effectively the funds available for higher education in order to assure maximum educational opportunity, those who support higher education, both privately and publicly controlled, are becoming increasingly insistent, and properly so, that specific evidence be provided which will give assurance of maximum utilization of resources. The absence of a profit and loss statement can no longer be used as an excuse for failure to provide

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adequate analyses of costs. A mere statement of beginning balances, income by source, expenditures by function or object, and ending balances is no longer sufficient. Questions are raised on every hand as to how the money was actually used.

Friends and alumni of privately controlled institutions, industry, foundations and individual philanthropists are asking questions regarding costs in institutions in which they have an interest. Public agencies at the local, state or federal level are being requested to provide ever greater services in many areas. Thus, they must know how funds are used in order to allocate wisely the dollars available. They are all aware of the continuous increase in total funds requested. They must know whether unit costs as well as total costs are increasing; they must know why.

Institutions that provide effective information, that are willing to supply data indicating changes in factors affecting costs, and that make every effort to effect economies consistent with maintenance of quality will undoubtedly gain the confidence of those who provide financial support. They should receive sufficient funds to provide quality higher education for their students. Institutions that fail to provide appropriate analyses of the factors affecting costs may lose the confidence of the public. They may suffer a decline in gifts, bequests or donations and may be subjected to arbitrary reductions in allotments or appropriations.

Earlier Studies of Factors Affecting Instructional Costs

Cost analyses and attempts to develop unit costs are not particularly new insofar as Colleges and Universities are concerned. Numerous attempts to measure instructional costs have been made during the past three decades or more. A number of articles on cost analyses were written in the twenties, and the financial reports of a few institutions at that time indicated costs per student. In 1932 the National Committee on Standard Reports for Institutions of Higher Education published Bulletin No. 3 entitled A Study of Methods Used in Unit Cost Studies in Higher Education. In 1935 this committee published a volume entitled Financial Reports for Colleges and Universities.

The volume published in 1935 contained a detailed plan for unit-cost computations. The plan included a method of allocating overhead or indirect costs as well as an anlysis of direct instructional costs. During this discussion we are primarily interested in an analysis of instructional costs, and, therefore, the brief description of the plan developed by the National Committee will be limited to that area. The plan proposed that instructional costs be computed for departments on a student-credit-hour basis, for divisions on a student-credit-hour or a full-time student equivalent basis, and for the institution as a whole on a full-time student equivalent basis. These costs were computed after a distribution of faculty time based upon instruction, departmental administration, divisional administration, institutional administration, research, public services, and so forth. Costs were

analyzed by levels of instruction as well as by division and department. The proposed plan was quite comprehensive and I recommend it to you for review. Unfortunately, this volume has long been out of print, but if you have not had an opportunity to study this plan for cost computation, it might be worth an inquiry at your library.

In 1937 the United States Office of Education published Bulletin No. 21, entitled University Unit Costs. This study was based upon the plan of cost computation proposed by the National Committee in the 1935 volume. Nine large universities participated in the study.

In spite of the fact that all participating institutions were large universities, and might therefore have some degree of homogeneity, there were wide variations among institutions with respect to cost per student credit-hour for the same subjects or fields of discipline. In this study, as in others, attention was directed to the need for caution in interpreting results and in attempting to compare one institution with another. It was emphasized that many assumptions had been made and that there are many "imponderable elements not susceptible to arithmetic measurement."

In passing, I should say that I agree with the need for caution, but even cost analysis for commercial and industrial firms requires some judgment and involves a degree of subjectivity. This alone should not be used as an excuse to avoid cost analysis. An analysis accompanied by a statement indicating both strength and weakness still might be very useful.

The United States Office of Education study also revealed major differences in student-credit-hour costs among the several fields of discipline within the same institution. I presume that this was not unexpected and is indicated also in studies today.

One part of the study revealed substantial uniformity with respect to student-credit-hour costs. This was the greater cost of upper division as compared with lower division and the even greater costs at the graduate level for the institutions as a whole. However, the differences in costs per student-credit-hour between the lower division and graduate level ranged from approximately twice as large in one institution to approximately five times as large in another. The progressive increase in cost from one level to another was not necessarily true for individual fields of discipline. For example, in one field of engineering, an institution reported a higher cost per studnet-credit-hour at the lower division than at either the upper division or graduate level.

A careful review of this study appears to indicate that the greatest variations in cost result from differences in the production of credit hours in relation to total instructional costs. Thus, salaries and faculty productivity largely determined the unit cost of instruction.

Faculty productivity is related to both class size and teaching loads. These are the factors with which we will be concerned in our discussion today.

What has happened to cost studies and cost analyses since the publication of the United States Office of Education study in 1937? Unfortunately, World War II was upon us very shortly thereafter. Within a few years colleges and universities became armed services camps. To be sure, unit costs were not forgotten entirely. Various methods were developed to determine payments for ESMDT, ESMWT, ASTP, V-12, V-5 and similar programs designed to promote the war effort of our nation and our allies. These methods were largely based upon rather hurried agreements and some compromises. Little real progress was made which would enable institutions to evaluate their normal costs.

When the war ended the nation provided benefits for returning veterans. A "G. I. Bill of Rights" gave to each returning member of the armed services a "credit" for educational opportunity. Again we "reviewed costs" and decided whether non-resident tuition or a cost factor for instruction would be most appropriate as a charge for the instructional services of our colleges and universities. Regardless of the decision that was made, a substantial portion of the instructional cost of higher education was underwritten by the Federal Government during the latter part of the forties. During the same period of time the purchasing power of the dollar shrank to a new low level.

By 1952, expenditures for educational and general purposes exceeded two billion dollars a year. The G.I. wave had subsided, and municipalities, states, friends, alumni and students were asked to provide a substantially greater portion of funds for operations. In view of the shrinking dollar and the predicted tidal wave of students, serious questions were raised relative to the future support of higher education. About this time the Commission on Financing Higher Education published an impressive volume by John D. Millett entitled Financing Higher Education in the United States. You may wish to review this volume and in particular those chapters dealing with factors in educational costs and program analysis of educational costs. The Commission stated that faculty salaries are important as a cost factor, but further indicated that "faculty salaries are not necessarily the controlling factors in determining instructional costs. High salaries which go along with a relatively high student-faculty ratio and a fairly high teaching load can make for low instructional costs." Again we note that class size and teaching load or, if you please, faculty productivity was considered a major factor in determining unit costs of instruction.

Complexity of Analysis

Now in the last year of the present decade and, therefore, in the very early years of the tidal wave, we generally are aware of the

desirability or even necessity of analyzing costs for future planning in the use of available resources. The many factors affecting costs again come to our attention. Most of us are becoming increasingly aware of the difficulty in recruiting and retaining outstanding faculty members. Salaries have improved but are still much too low, and we recognize that salaries in higher education must be consistent with those in other fields of endeavor. However, if salaries are to be increased substantially, if enrollments are to be doubled, and if the dollar continues to shrink, some modifications must be made in the factors affecting costs. The factors are many and complex. Analysis and change will not be simple.

The scope and type of the educational program itself has a substantial affect upon total and unit instructional costs. As previously indicated, there is a wide variation in costs among the several fields of discipline within an institution. These costs also vary from institution to institution. Most of the studies undertaken to date indicate relatively low unit costs for law and business administration, and relatively high costs for medicine and the physical sciences. It is interesting to note that law and business administration have been among the last survivors of the proprietory schools. High "faculty productivity" and corresponding low unit costs may have encouraged the continuation of these proprietory schools.

One of the next important factors affecting costs is the distribution of faculty time. This is exceedingly difficult to determine and must be based upon the judgment of individual faculty members or a departmental chairman. In many of our colleges and universities, faculty members spend a portion of their time in teaching, research, public service, departmental administration, college or university administration and committee assignments. For obvious reasons no one would suggest that time clocks be installed for use by the faculty. Nevertheless, some means must be found to determine actual instructional costs by separating these from the cost of other services provided by members of the faculty. It is this time distribution that has caused much discussion and some controversy. However, even commercial and industrial organizations are faced in part with similar problems. To be sure, the time of the skilled worker on an assembly line can be fairly well allocated, but the time of the supervisor and the professional man who may spend time on several activities or projects must be allocated to produce unit costs. The techniques involved in any time allocation always may be subject to question, but, if applied consistently, the results may still be reasonably satisfactory. As far as the faculty is concerned, if a pattern of time allocation is once established, it could be used from year to year with only periodic spot checking.

A third factor affecting both total and unit costs is the level of instruction. As previously indicated, there appears to be a consistent increase in over-all unit costs as we progress from one level of instruction to another. Again, however, there are complications. Some courses are available to both lower division and upper division students,

and certain courses may be open to both undergraduates and graduates. This will add to the complexity of cost analysis and will require judgment with respect to cost determination by levels of instruction. All costs might be classified according to the status of individual students but more usually according to level for which the course is primarily designed.

A fourth factor affecting instructional costs is that of the distribution of faculty by rank. Institutions generally provide for a gradual advance in academic rank for qualified faculty members. The upper academic ranks usually command greater salaries. Thus, as the faculty matures, costs must of necessity increase. If the institution does not grow in size and if there is little faculty turnover, costs will continue to advance. An interesting condition occurred during the temporary decline in enrollment in the late forties. Costs actually increased since few teaching assistants or beginning instructors were appointed during the period of declining enrolling.

Class size and student faculty ratio are still other factors affecting costs. On the surface it would appear that these factors are least complex and might easily be adjusted to modify both total and unit costs. However, these factors have been so closely related to the concept of quality in education that many institutions have been reluctant to effect any substantial change. In spite of the fact that several writers in the field of higher education have given specific examples of what might be done to improve salaries and recruit top instructional faculty if class size or student faculty ratios were modified, institutions have still attempted during the past years to "improve student faculty ratios," i.e., decrease the number of students per faculty member.

Closely related to class size is teaching load. There apparently has been a general belief that in order to recruit and retain top quality faculty members, the institution must provide a minimum teaching load. Furthermore, this teaching load may be reduced if the faculty member shows unusual promise in the field of research.

A seventh factor affecting instructional costs is the general level of faculty salaries. If all other factors could be held constant, it is obvious that the institution which pays the highest salaries will have the highest costs. By this time, however, it is quite clear that many of these factors affecting costs are so inter-related that each must be considered separately and in relation to all other factors if an accurate cost analysis is to be made.

Perhaps more has been said and less has been done about proliferation of courses than any other single factor. It would appear that the abandonment of courses would be a simple way in which to reduce costs. Unfortunately this is not the case. Many courses with very low enrollments are maintained in order to provide a complete curriculum. Courses

may be added and retained in order to recruit and retain faculty members. Still others continue to be offered in deference to particular faculty members who have had many years of service and who may have an emotional attachment for a particular course that they have given for many years. Proliferation of courses is not only the result of faculty wishes. The advance of knowledge, the demand for specialization at upper levels, and the need to prepare students to participate in an increasingly technical society also have brought a substantial increase in course offerings.

Degree requirements may vary substantially from one discipline to another. The total number of courses, the number of required courses, the type of courses, and the amount of laboratory work all will have an impact upon total and unit costs. This again will add to the complexity of analysis and will increase the difficulty of comparing costs within and among institutions.

Finally, the selection of a unit to determine cost or productivity creates further problems. No general agreement as yet has been reached relative to the usefulness or validity of the several units which may be used. The "full-time student equivalent" has been proposed, but this tends to ignore certain costs involved in providing space and teaching facilities for two part time students who may select the same course at the same time. The "student credit hour" was suggested in the 1935 volume of the National Committee on Standard Reports for Colleges and Universities. This was used in the 1937 study of the United States Office of Education. Again, there is an inherent weakness since the credit hour represents the institutional award to the student for attending a given number of class hours. If these class hours involve laboratory sessions the credit hours awarded may be substantially less than the actual class hours attended. Student class hours per week probably represent one of the least complex units that can be used. However, it should be recognized that these account only for the cost for each hour of attendance. Thus a scientific course requiring a laboratory session might meet three hours during a week and provide two credit hours, whereas a course in humanities might provide three credit hours for three hours of meetings. The cost of each hour of meeting might be the same, but the credit hour cost in the scientific course would be greater than the credit hour cost in humanities.

No standards or norms have been developed in our educational programs, and no adequate measures of quality have been devised. Quality must be related to the end aims and objectives of the institution. The automotive industry can produce a low priced vehicle or an expensive automobile. Both may be quality cars within the intent or objective of the industry. We do not know whether the student-faculty ratio should be ten, twenty, or thirty to one. We do not know whether classes should have an average of twenty or one hundred students, whether students should attend classes for ten or fifteen hours per week, or whether faculty members should teach six, nine or twelve hours per week. We do know, however, that we can materially change unit costs by modifying the major factors affecting these costs.

This, then, must be our challenge, to experiment with changes that will provide maximum educational opportunity consistent with the quality necessary to meet the objectives of our institutions.

Effect of Class Size and Teaching Load on Instructional Costs

Exclusive of faculty salaries, two major factors appear to have the greatest impact upon instructional costs--the size of the class and teaching load. Or, stated another way, instructional costs are largely determined by the productivity of the faculty. In a recent publication by Beardsley Ruml and the late Donald H. Morrison, models were developed for liberal arts colleges of various sizes. In each model it was assumed that there would be an average student faculty ratio of 20 to 1 and that each faculty member would have a teaching load of 9 to 9 1/3 hours per week. A somewhat similar proposal was made by John D. Millett some number of years ago. Each study suggested that major salary adjustments could be made by establishing a fairly high student faculty ratio or average classs size and a fairly high average teaching load. The latest study will and should receive careful consideration by faculty members, administrative officers and members of governing boards. Yet we must carry the analysis further in each of our institutions to be certain that we do not over-simplify and that we consider the distribution of students by instructional level and the type of educational program to be provided.

Some variation in class size may be appropriate and desirable among the several levels of instruction. This does not mean that class size must necessarily decrease with advances in the level of instruction. Traditionally smaller classes at the upper division or beginning graduate level may be due as much to the decrease in the number of students and to greater specialization as to any deliberate attempt to provide greater individual attention to the students. At the graduate research and doctoral level, the need for small classes or individual instruction is quite obvious. However, the general tendency toward smaller classes as the level of instruction advances has resulted in an increase in unit cost at the higher levels.

No intelligent decisions relative to class size can be made without a careful analysis of existing class size by levels of instruction. No over-all standard of class size can be imposed upon the institution. If students at the upper division or graduate level are not available in the same numbers as the lower division there must be either a substantial reduction in course offerings or a reduction in class size. On the other hand, an institution that receives large numbers of students at an advanced level may find it both possible and necessary to establish different standards of class size for the advanced levels of instruction than those institutions which traditionally find themselves with large freshman classes and a decreasing number of upper classmen or graduates. It may be entirely appropriate and desirable to establish different standards of class size or student faculty ratio at the different levels based upon the differences in numbers of students available at the several levels.

Class size also must be analyzed in terms of the educational program and the fields of discipline. In certain curricula large classes have been almost traditional regardless of the level of instruction. As already indicated, large classes at the graduate level in law have resulted in low unit costs in spite of relatively high faculty salaries. To some extent large classes in business administration and education have also resulted in low unit costs. On the other hand, smaller classes in physical sciences, engineering and medicine have produced relatively high unit costs. Whether such higher unit costs in selected fields of discipline are justified on the basis of necessity or quality must still be considered.

If appropriate space were available and if all other factors affecting costs could be held constant, a doubling of average class size at all levels would nearly cut instructional unit costs in half. To be sure, we might have to revise our concept of the proper size for classrooms and laboratories, and this might involve some one-time remodeling costs. We might also need to provide some further assistance for the faculty in grading papers and performing other routine chores. We would also need some additional supplies and equipment for our classrooms and laboratories. These would be nominal in view of the tremendous increase in faculty productivity which would occur, regardless of the units used to calculate costs. There would remain, however, the larger question, What effect would doubling of class size have upon the quality of instruction? Perhaps a possible deterioration in the learning environment could be offset by a careful study aimed at providing lecture sessions, class instruction, seminars and individual instruction at all levels and in all fields of discipline. At least further experimentation might prove very useful.

An increase in faculty teaching load of ten to twenty-five per cent also would have a material impact upon unit costs, since again the productivity of the faculty would be increased substantially. In reviewing the possibility of increasing the teaching load, we are confronted with even more difficult problems. Again we must consider the level of instruction and the need for much personal attention at the doctoral level. On the other hand, we must also consider the need for personal attention for beginning undergraduates. We must recognize differences among the fields of discipline, the need for outside preparation in rapidly changing fields, the need to correct papers, supervise teaching assistants and differences in effort required to teach three sections of the same subject as compared to teaching three different subjects. We must consider the effect that an increase in teaching load may have upon the quilty of instruction, research, and other scholarly pursuits of the faculty. Independent scholarly research has some impact upon the entire learning environment, and it is sometimes quite difficult to differentiate between instruction and that which is known as departmental research.

Finally, we cannot overlook individual differences in faculty any more than we can ignore differences among students. In spite of careful

selection of faculty members and years of service required before the granting of tenure, there are and always will be substantial differences in capacity. There has been little inclination to modify teaching loads as a result of differences in capacity. To be sure there is some tendency to add other duties such as committee assignments, but occasionally the most gifted members of the faculty and those who might materially increase their teaching productivity are assigned minimum work loads in order to retain their services. In the July 8, 1959 issue of the Wall Street Journal there appeared an aritcle indicating that institutions were offering decreased teaching loads as a means of recruiting faculty. The need to recruit and retain outstanding faculty members is already acute and will become increasingly difficult. However, if the means of doing so is a reduction of productivity, the educational opportunities will decrease at a time when they must be increased very substantially. Increased productivity and increased salaries as suggested by Beardsley Ruml may be a more effective solution.

The California-Western Conference Study

This morning Dr. Doi discussed certain aspects of class size and teaching loads as related to instructional costs. He also described some of his own work in Colorado and other states. I should like now to briefly discuss certain phases of the California-Western Conference Cost and Statistical study and also to make some reference to studies of individual institutions in other states. Unfortunately, there are two limitations in connection with information that I can provide from the California-Western Conference study. The first limitation involves time, your time. A staggering volume of data was accumulated. I could discuss this for the balance of the week. The second limitation involves timing. Since the report of the study is about ready for publication, I am not free to discuss all aspects as readily as if it were already published.

You have in your reading material a statement of the purpose and procedure of the study, the standard classification used and certain forms and directions used in compiling data for the analysis of instruction. The forms and instructions for forms L-1, L-2, L-3 appear in Appendix A of this volume.

Although all expenditures of each participating institution were reported in order that they might be reconciled with annual financial reports, as indicated in the statement of procedure, three major areas of institutional activity were analyzed in greater detail. These were (1) administration, general expense and libraries; (2) instruction; and (3) operation and maintenance of the physical plant. In this discussion we are concerned only with instruction since we are interested in the impact of class size and teaching load upon instructional costs.

The instructional program data were reported in terms of the college or school and department in which the course was taught, the subject field of the course, levels of instruction, credit value and

enrollment, type of instruction, i.e., non-laboratory, laboratory or individual student, the class hours per week and enrollment for each class or section of the course, and the instructor for each class or section. No detailed analysis was made of costs in medicine, dentistry, nursing and public health.

A quick review of the forms used to accumulate data for the instructional phase of the study will serve to illustrate procedure and type of information obtained. The first form (L-1) was used for both instruction and physical plant analyses. Separate sets of these forms were completed for each semester or quarter of the academic year. The data were separately reported for each campus of each institution, for each school or college within a campus, for each department and for each subject within a department. Every course taught during the academic year was reported; and for each course, the level of instruction, credit-value, enrollment, and number of classes or sections. The type of instruction, the class hours per week, the section enrollment and the instructor or instructors were also reported on this form. The data from form L-1 were used to calculate student-credit-hours, student class hours per week, the distribution of classes by subject, average class sizes, and so forth.

The second form (L-2) was used to distribute the time of each faculty member among his teaching and non-teaching activities and to report actual salary expenditure. It was at this point that an attempt was made to analyze and distribute time which is frequently budgeted or charged in total as a teaching cost. This meant a time distribution among actual teaching, departmental research, departmental administration and public and professional services, as well as a distribution of time for activities usually budgeted separately, such as organized research or general administration.

The division of the faculty members' time among the various activities or services was based upon the judgment of the head of the department, school or college to which the individual was assigned. The difficulty of making this division of an individual's time has been mentioned previously. There is still much disagreement regarding this distribution, both with respect to the validity and usefulness. Certain activities are so closely related, such as teaching and departmental research that arbitrary decisions which may be necessary tend to destroy validity. Furthermore, it is generally expected that a faculty member will teach as well as conduct research. The usefulness of any time distribution has therefore been questioned.

However, since distribution of time is a significant factor in determining faculty productivity, it would appear wise to at least review such possibility particularly if comparisons are to be made with other institutions. Even in an intra-institutional analysis, time distribution would be significant in accounting for variations among departments and fields of discipline. In any event a series of studies extending over a period of time would serve to indicate trends. This

would be useful regardless of whether a detailed breakdown of time was involved, and would indicate changes in faculty productivity.

On a third form (L-3) all departmental expenditures for purposes other than teaching salaries were reported. These included expenses for non-faculty wages, supplies and expense. This form also was used to show the distribution of expenditures between the academic year and the summer session, and the distribution of the academic year expenditures among the levels of instruction in the teaching program and among non-teaching functions of departmental research, departmental administration, and public and professional services.

As would be expected, the departmental expenditures reported for purposes other than teaching salaries were, in general, substantially less than those reported on form L-2. However, there were significant variations because of the requirements of certain fields of discipline. Non-faculty salaries and equipment purchases tend to be somewhat higher in scientific fields. Thus, while faculty productivity is still the largest factor affecting costs, these costs could presumably be modified, rather materially, by changes in equipment purchases or changes in the number of non-faculty personnel employed in academic departments.

These three forms briefly described were the basic ones used to accumulate information regarding the instructional program. Several other forms included in your material were used for limited purposes, such as providing the dollar amounts required for the instructional forms. The data available from these instructional forms was tremendous. A complete tabulation was provided for each campus of each participating institution.

Both the techniques and results of the study have been used by a number of participating institutions for additional studies. Unfortunately, at the present time there are no definite plans to continue cooperative studies. Several drafts for a published report have been prepared. The final draft is nearly completed and should be published early in the fall. The published report will be quite brief but will be sufficient to indicate procedures and techniques and the results which may be obtained if these techniques are followed.

The greatest value of the study accrued to participating institutions. However, other institutions may wish to use the procedure developed for internal studies or studies in cooperation with other institutions. The fact that a number of institutions could finally agree upon classification, the use of units of measurement and distribution of faculty time was in itself somewhat remarkable. There was no final agreement as to whether student credit hours or weekly student-class-hours were most appropriate. Both were used in the study and either or both may be used in the future provided that there is consistency in use.

As previously stated, there was much discussion relative to the desirability of distributing faculty time. However, since faculty productivity involving teaching load and class size is such a major factor in determing costs, the institutions remaining in the study agreed that time distribution should be attempted in order to measure faculty productivity more effectively. In fact faculty productivity alone can serve as an excellent guide for institutional planning even if no attempt is made to develop unit costs. Changes in productivity resulting from an increase or decrease in teaching load and an increase or decrease in class size are so closely related to instructional costs that institutional officers can readily predict future needs by analyzing trends of productivity.

The California-Western Conference study made no attempt to evaluate quality. The lack of objective means to evaluate quality has undoubtedly led to some reluctance to develop statistical studies. Since the "product" of the instructional program of a college or university consists of the development of an environment conducive to learning and since the capacity for learning varies substantially from one individual to another, it is doubtful if any completely objective means can ever be developed to measure quality. If quality is related to ultimate success of faculty or graduates, we must define success in terms of factors currently related to success. These may be scientific achievement, business ability, scholarly pursuits, political or diplomatic accomplishments, service to mankind or just getting along with your neighbor.

The California-Western Conference study has been criticized for its detail and complexity. It was an ambitious undertaking, and it is obvious that such a study might be financially difficult for many institutions that do not have substantial support from outside sources that was available for this study. Again, however, if a pattern of faculty productivity were once established, it may be possible to accumulate data year after year with only occasional checking of the validity of such a pattern. Furthermore, a number of "short-cuts" may be made, as will be indicated in the published report.

A number of studies are now under way on a continuous basis both statewide, as far as publicly controlled institutions are concerned, and by individual institutions for both publicly and privately controlled colleges and universities. Some of these studies are conducted through statewide coordinating boards, or commissions such as Texas, New Mexico, Oklahoma, etc. Others are conducted on a voluntary basis as a result of agreement among the publicly controlled institutions of higher education. This is presently the situation in Indiana. There are also some attempts to study instructional programs and costs in specific fields of discipline among several institutions. The cost of medical education may be studied on a pilot basis.

Individual colleges and universities in increasing numbers are undertaking institutional research that includes a study of the

instructional program. The Universities of Illinois and Minnesota and Michigan State University are among those undertaking fairly comprehensive studies for internal use in planning. There are many others, of course. While most studies involve statistical analyses of the several functions of the institution, there appears to be a trend toward a more detailed study of the instructional program and the impact that faculty productivity has upon instructional costs. Most of the institutions use these data in planning and budgetary development, but, to the best of may knowledge, few, if any, are actually using program or cost accounting as a part of their regular budgetary operation and accounting procedure.

It is my firm conviction that within a few years most of our colleges and universities will develop programs of self analysis in order to determine costs. It is my sincere hope that there will be favorable faculty response and participation in these analyses and that these studies will lead to wiser use of resources, greater educational opportunities and improved faculty compensation. The greatest value will be intra-institutional, and will come as a result of continuing studies using the same guides and techniques which will indicate trends for future planning. There may be some value in making inter-institutional comparisons, but these will be of less significance than a periodic check of cost trends or productivity within an institution.

A single one-time study would appear to have very limited use. The chances are extremely remote that costs will ever again in the future be identical to those observed at a given period of time. Changes in faculty, student population, curricula--in fact any change whatsoever in any of the factors affecting costs will change total and unit costs. The analyses in the future should involve a continuous study of all factors affecting costs.

Since, however, such a large portion of resources are used in the instructional program, we should be increasingly interested in the class size and teaching load, the two factors involving faculty productivity that can dramatically change unit costs in a very short period of time.